Draft

Vulnerability of Bay-Delta Systems Functions

Problem Statements

The Bay-Delta system is subject to physical damage, loss of productivity, and an unacceptably high risk of catastrophic inundation of Delta islands due to potential levee failure from earthquakes, floods, and physical condition. Loss of agricultural production, damages to wildlife habitat and infrastructure, could can result due to gradual deterioration of Delta conveyance and flood control facilities. Increased salinity intrusion into the Delta adversely affecting habitat and water supply operations can result due to sudden catastrophic inundation of Delta islands. Continuing need for levee maintenance and periodic levee failures indicate that the vulnerability of Bay-Delta functions is unacceptably high.

The major problems are:

A. **Existing Agricultural Land Use, Economic Activities, and Infrastructure in the Delta are at Risk from Gradual Deterioration of Delta Conveyance and Flood Control Facilities as well as Sudden Catastrophic Inundation of Delta Islands.** Seepage, erosion, and overtopping of levees, and subsidence of Delta islands and the adjacent levees disrupts farming operations as well as other land uses, and infrastructure and requires constant maintenance efforts. Inundation of one or more islands in the Delta can disrupt farming operations and other land uses either permanently or for a significant period of time until repairs could be made. Inundation of roads, electric power lines, telephone lines, gas mains, and other infrastructure can cause lengthy breaks in service. In addition, several State highways and many Delta roads run along levees that are vulnerable to collapse due to erosion, seismic events or structural failure. Major water pipelines also pass through the Delta and are at risk of failure. Even if they survive the initial effects of inundations, long-term inundation would make continued maintenance and repair much more difficult.

1. **Reduction of Agricultural Productivity and Damage to Infrastructure** can result from seepage, and overtopping of the levees. Subsidence of the Delta island peat soils and foundations places additional pressure on surrounding levees and increases the risk of failure.

2. **Long-term Loss of Agricultural Productivity and Infrastructure** can result from catastrophic island inundation.

B. **Water Supply Facilities and Operations in the Delta are at Risk from Increased Salinity Intrusion, which can result from Sudden Catastrophic Inundation of Delta Islands.** Inundation of one or more key islands in the western and central Delta can allow salinity to intrude further into the Delta. This salinity intrusion can result in a need to halt In-Delta use as well as export pumping, perhaps for extended periods, until flushing flows released from upstream reservoirs lower salinity in the Delta water supply to acceptable levels. Stored water supplies in upstream reservoirs could be seriously depleted.

1. In-Delta water supply can be interrupted as a result from catastrophic island inundation and resultant salinity intrusion. (See Water Supply Problem Statement.)

2. Export water supply can be interrupted as a result from catastrophic island inundation and resultant salinity intrusion. (See Water Supply Problem Statement).

C.**Water Quality in the Delta is at Risk from Increased Salinity Intrusion which can result from Sudden Catastrophic Inundation of Delta Islands.** Inundation of one or more key islands in the western and central Delta can allow salinity to intrude further into the Delta. This salinity intrusion can result in degraded Delta water quality, perhaps for extended periods, until flushing flows released from upstream reservoirs lower salinity in the Delta water supply to acceptable levels. Stored water supplies in upstream reservoirs could be seriously depleted.

1. Water quality for some In-Delta beneficial uses can be degraded as a result of catastrophic island inundation and resultant salinity intrusion. (See Water Quality Problem Statement).

2. Water quality for export water supply can be degraded as a result of catastrophic island inundation and resultant salinity intrusion. (See Water Quality Problem Statement).

D. **The Existing Delta Ecosystem is at Risk from Gradual Deterioration of Delta Conveyance and Flood Control Facilities as well as Catastrophic Inundation of Delta Islands.** Seepage, erosion, and overtopping of levees, and subsidence of Delta islands and adjacent levees requires constant maintenance

efforts which can damage valuable habitat and/or reduce its productivity. Significant habitat for terrestrial species would be severely damaged by inundation of one or more Delta islands. If the inundation continued for extended period, survival of flora and fauna dependent on the habitat would be critically reduced. In addition, as described above, salinity intrusion into the Delta can increase causing significant impacts to aquatic freshwater habitat.

1. **Reduction of Ecosystem Productivity** and damage to valuable habitat can result from seepage, erosion, and overtopping of levees. Subsidence of the Delta island peat soils and foundations providing this ecosystem productivity places additional pressure on surrounding levees and increases the risk of failure.

2. **Long-term loss of valuable Aquatic and Terrestrial habitat** can result from catastrophic island inundation and resultant salinity intrusion.